

**UNCLASSIFIED**



# **JBMC2 SYSTEMS INTEROPERABILITY**

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# Agenda

- **DOD and Joint Staff Directives**
- **Interoperability Certification Process**
- **Pathfinder System Status**
- **JBMC2 Test Capabilities**



# Joint Interoperability Directives & Instructions

## DODD 4630.5

IT and NSS interoperability and supportability are essential.

## DODD 5105.19

DISA shall ensure end-to-end interoperability.

## CJCSI 6212.01B

All NSS and IT, regardless of ACAT, must be tested and ... certified by (DISA) JITC.

## DOD 4630/5000

Interoperability is the ability to provide and accept data, information, materiel, and services ... and ... includes both the technical exchange of information and the end-to-end operational effectiveness of that exchange, as required for mission accomplishment.

## DODI 4630.8

All systems must be tested for interoperability before fielding ... and certified by (DISA) JITC ... throughout a system's life.

## CJCSI 3170.01C

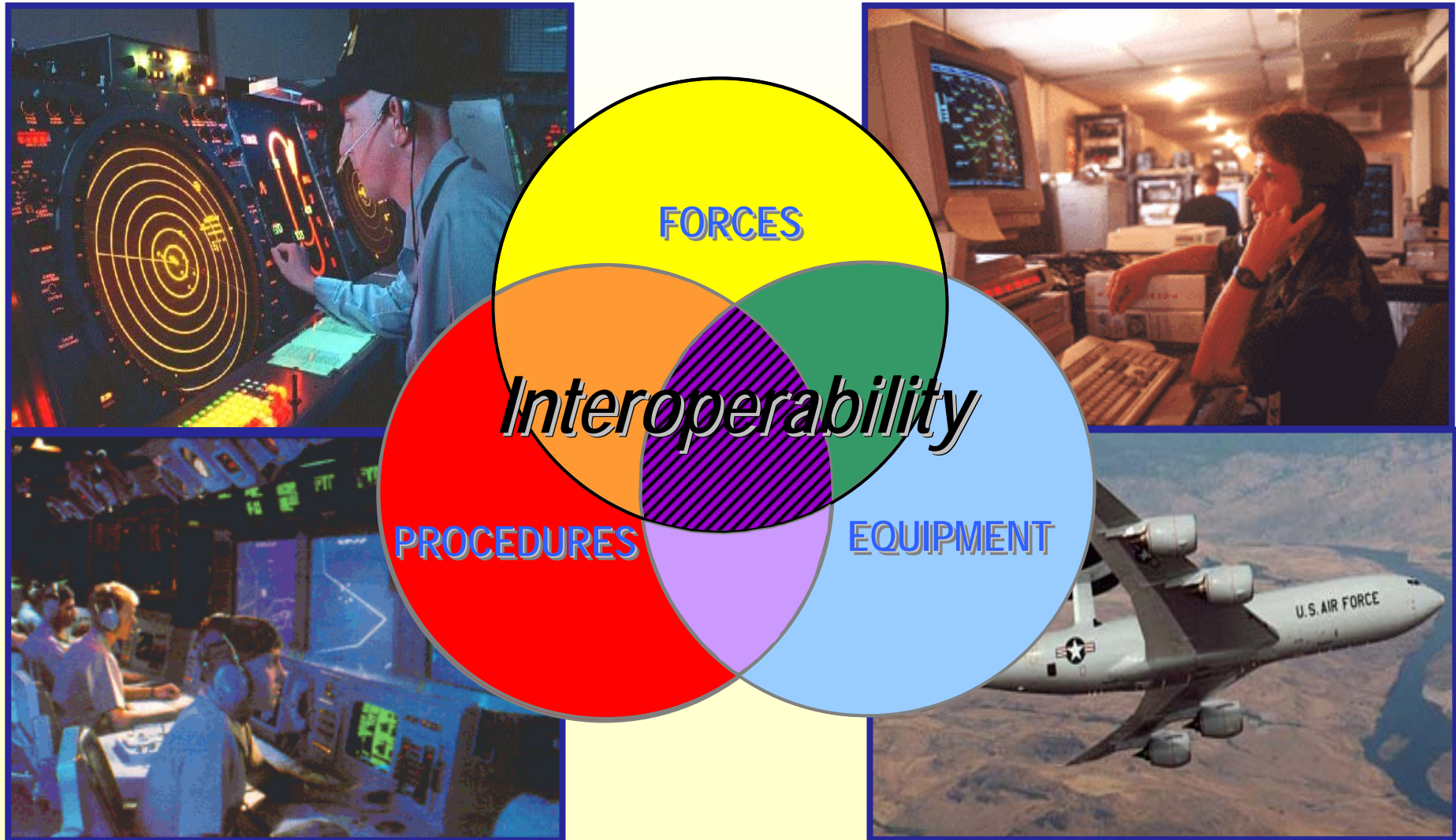
Mandates interoperability KPP for CDD, CPD, & CRD.

## DOD 5000 series

For IT systems, including NSS, ... JITC shall provide system interoperability test certification memoranda ... throughout the system life-cycle and regardless of ACAT.



# Interoperability Perspective





# Focus of Interoperability

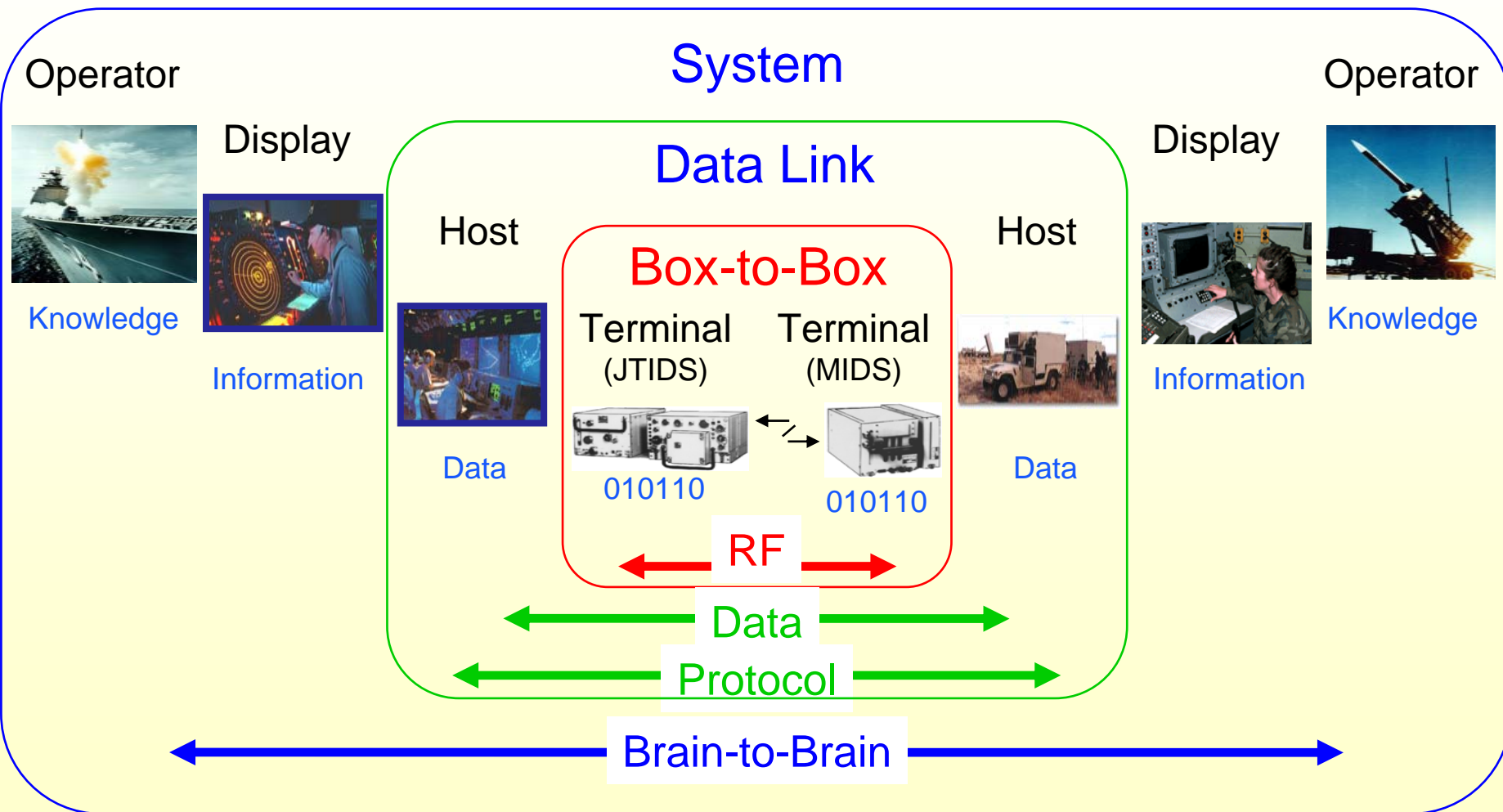
- **Standards Conformance**
  - Information Exchange per Mil-Standards
  - Service level developmental testing & JITC testing
  - Distributed testing with Hardware in the Loop & Joint Participants



# Focus of Interoperability

- **System Interoperability**
  - Information exchange IAW Information Exchange Requirements (IERs)
  - Ability of systems to provide information in order to operate effectively together IAW operational systems
  - Use OTs, Joint Tests & Experiments, and Joint Exercises (For Legacy Systems)

# Brain-to-Brain System Level Interoperability

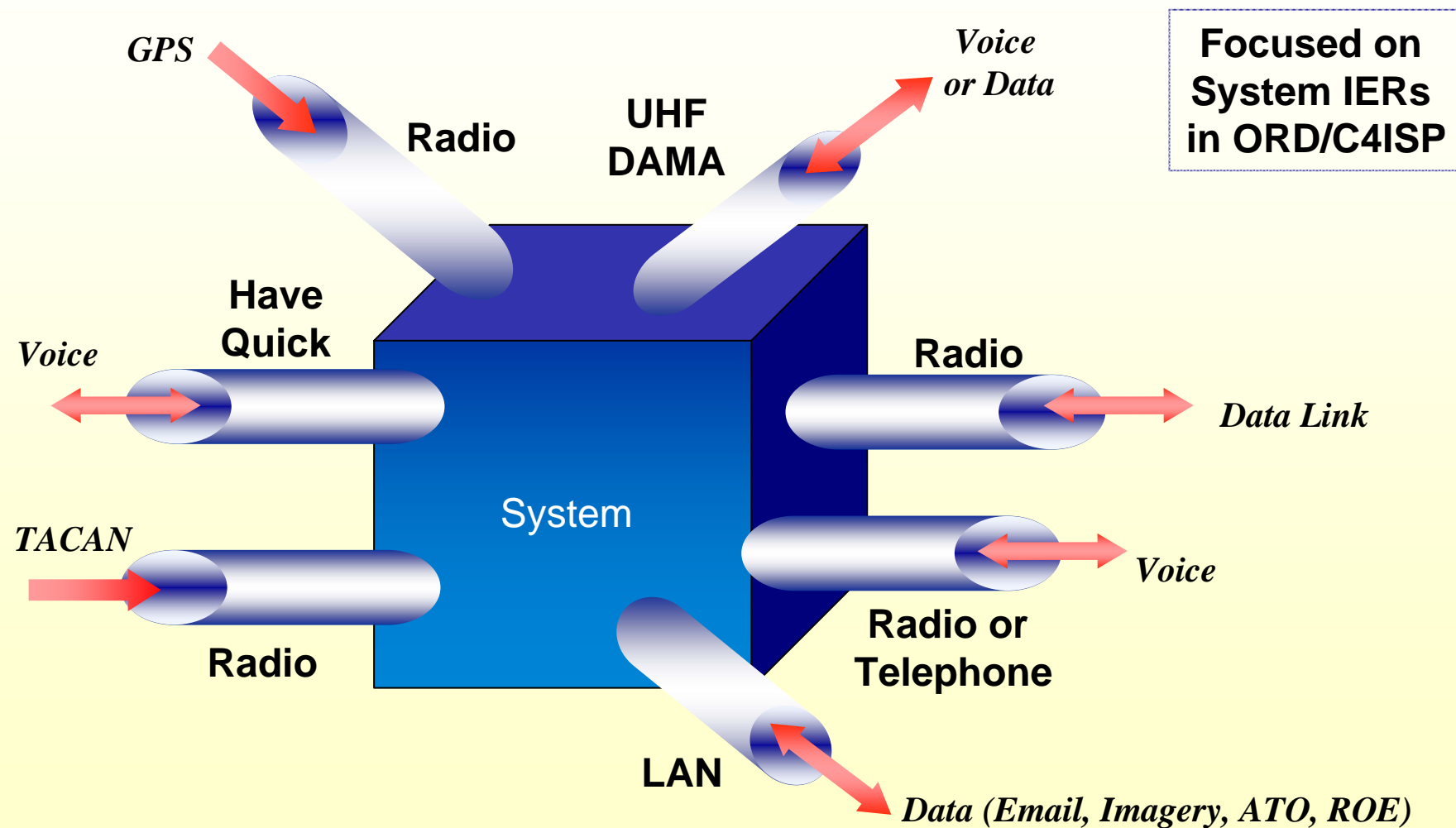


Legend: — Technical IO — Procedural IO — Operational IO





# System View

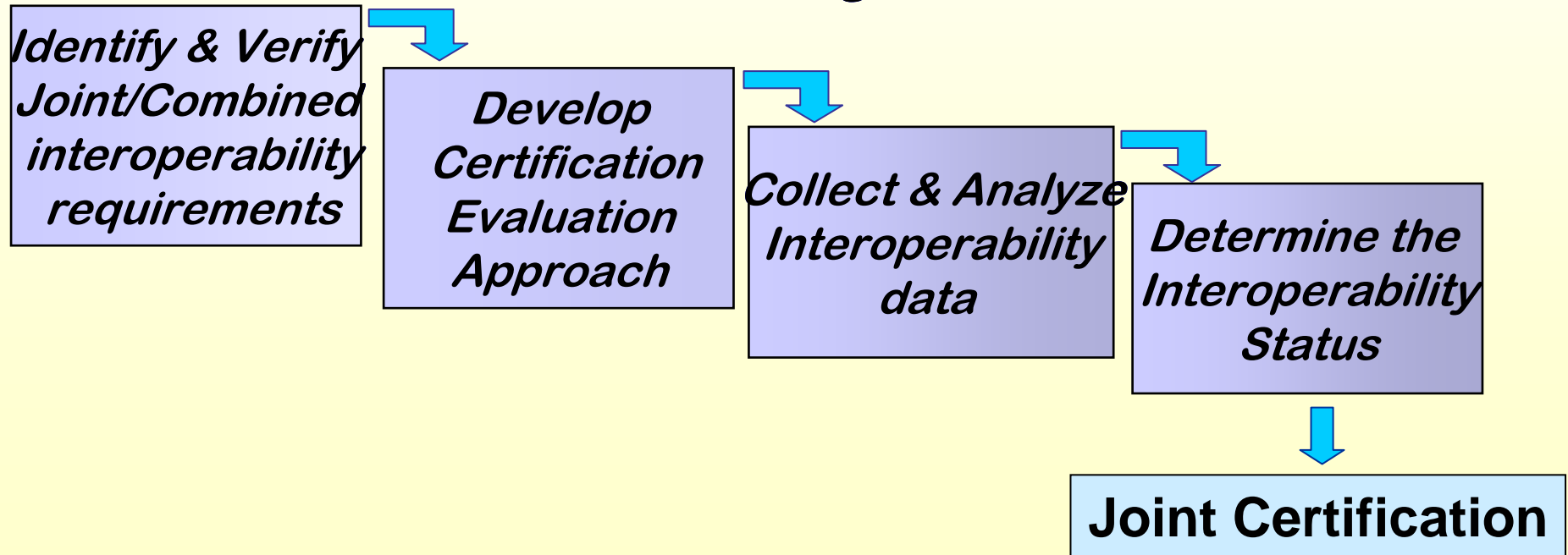


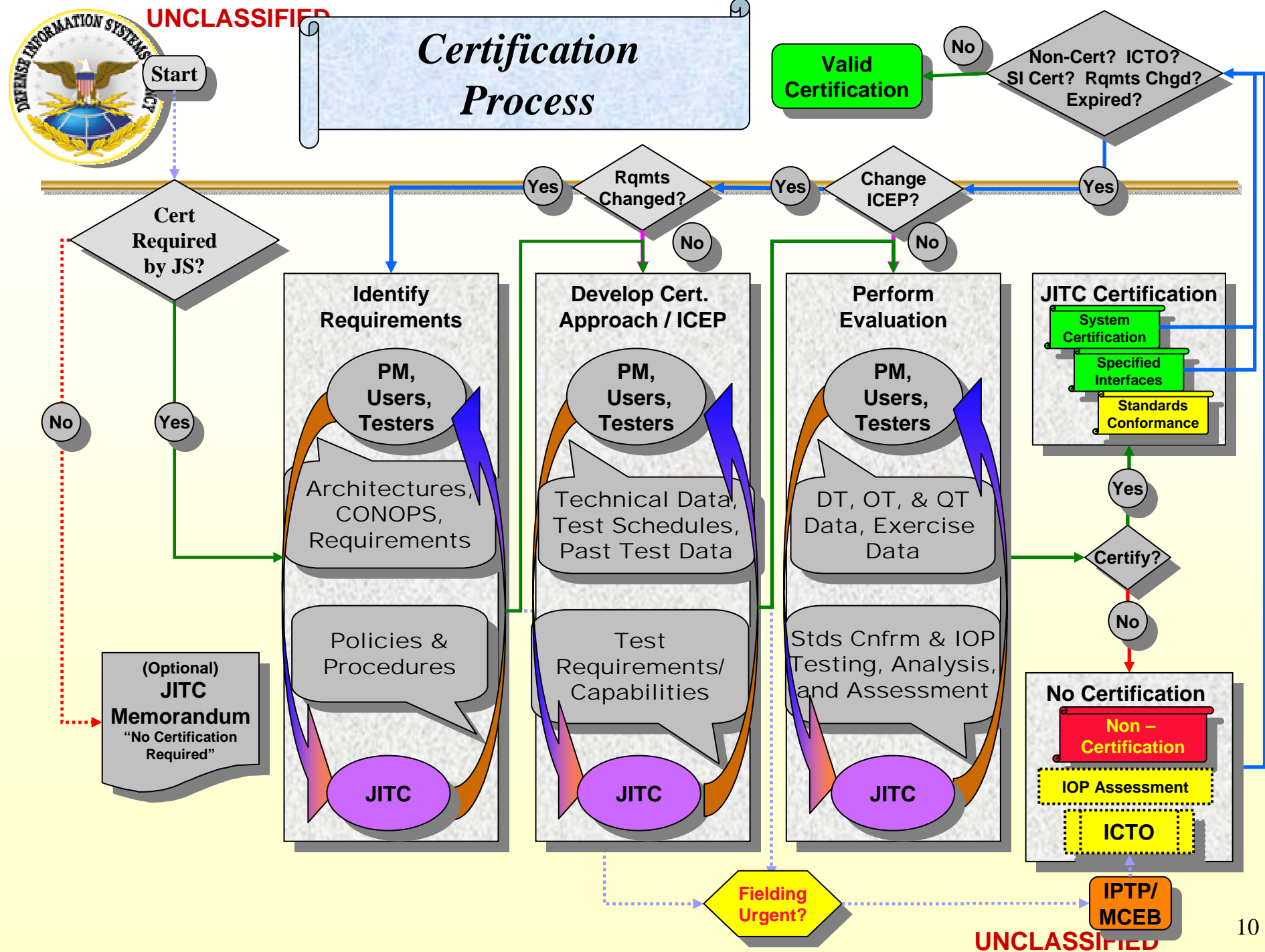




# What does Certification involve?

*The Certification Team,  
including the system proponent, system developer,  
user representative, service testers, and  
JITC work together to:*

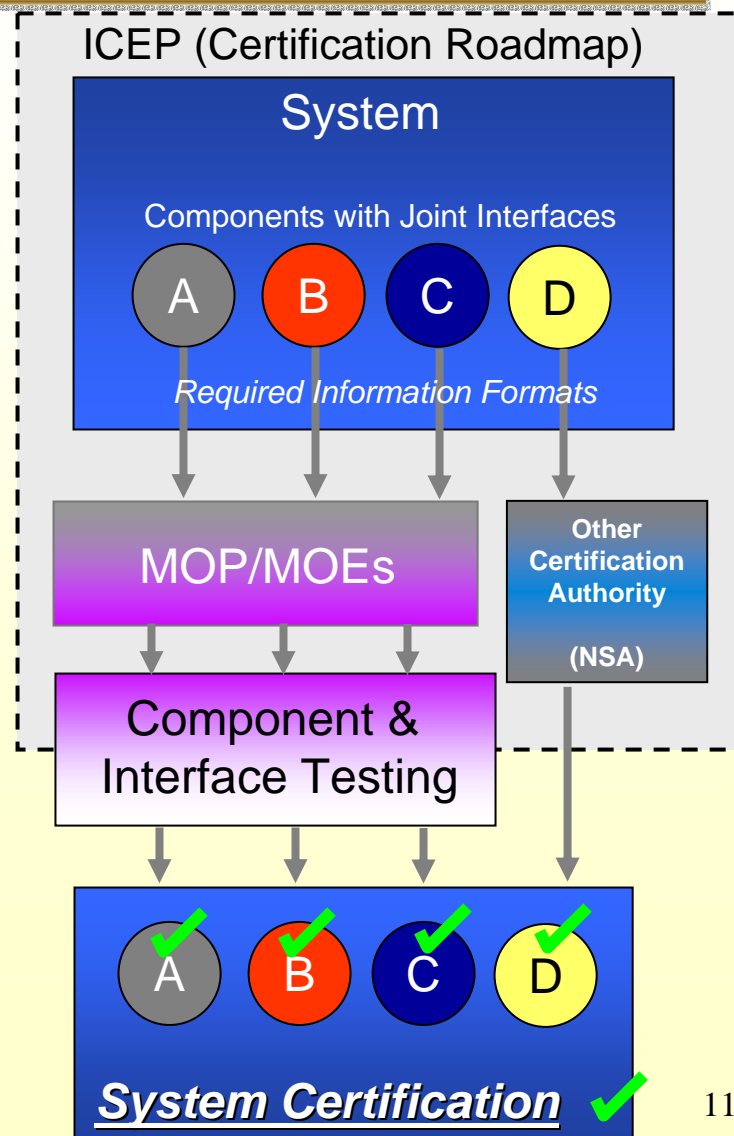






# Interoperability Certification Evaluation Plan

- Provides overview of system architecture and supporting IERs.
- Identifies previously certified subsystems.
- Provides interoperability testing plan to support system-specific acquisition model.
- Establishes data collection and analysis plan to support interoperability testing requirements.
- Documents MOE/MOPs to support testing of IERs (eg timeliness, completeness, accuracy)
- Lists the test events where data can be collected.





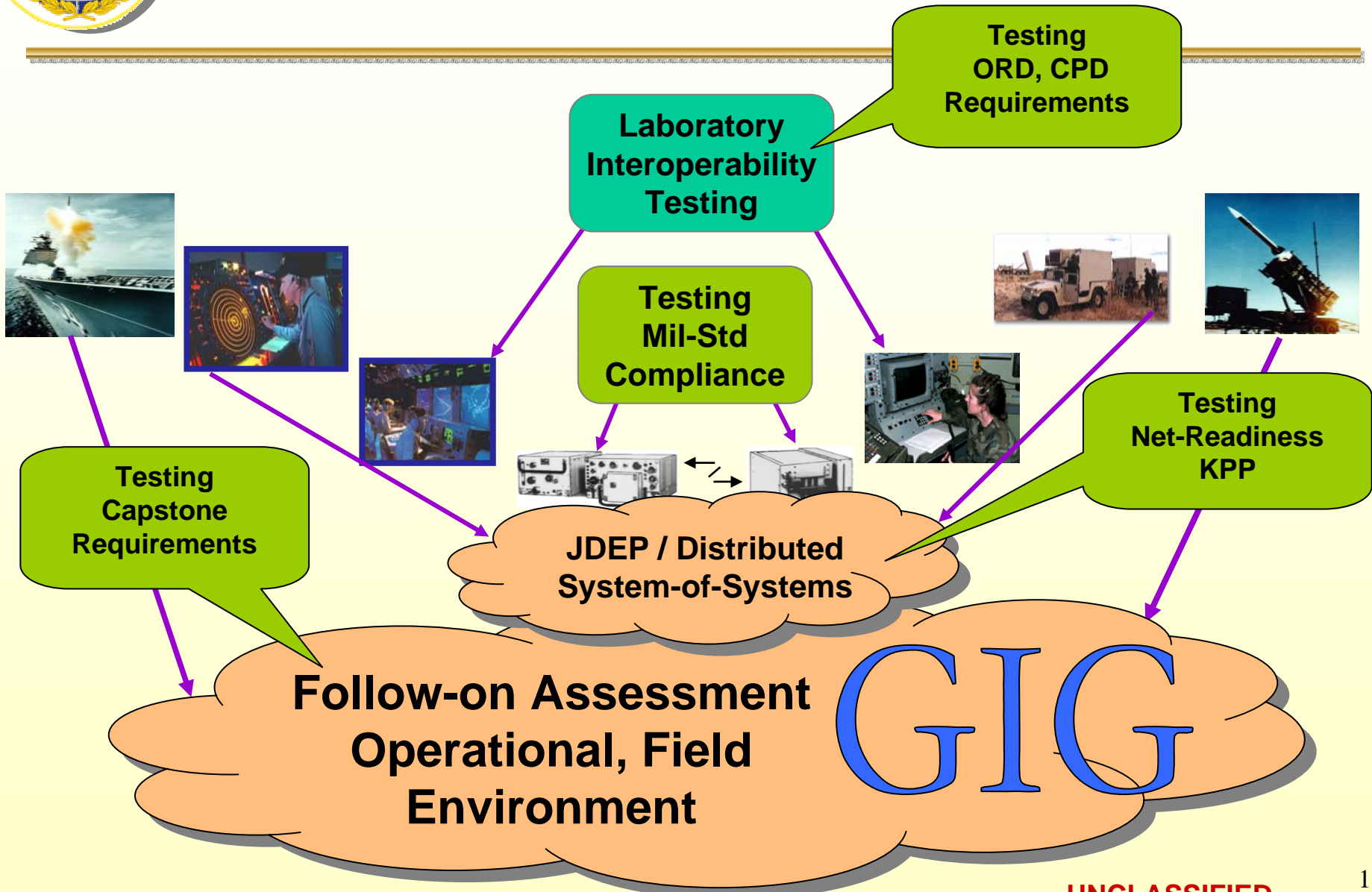
# Net Readiness KPP

**Based on the following components per  
CJCSI 6212.01C:**

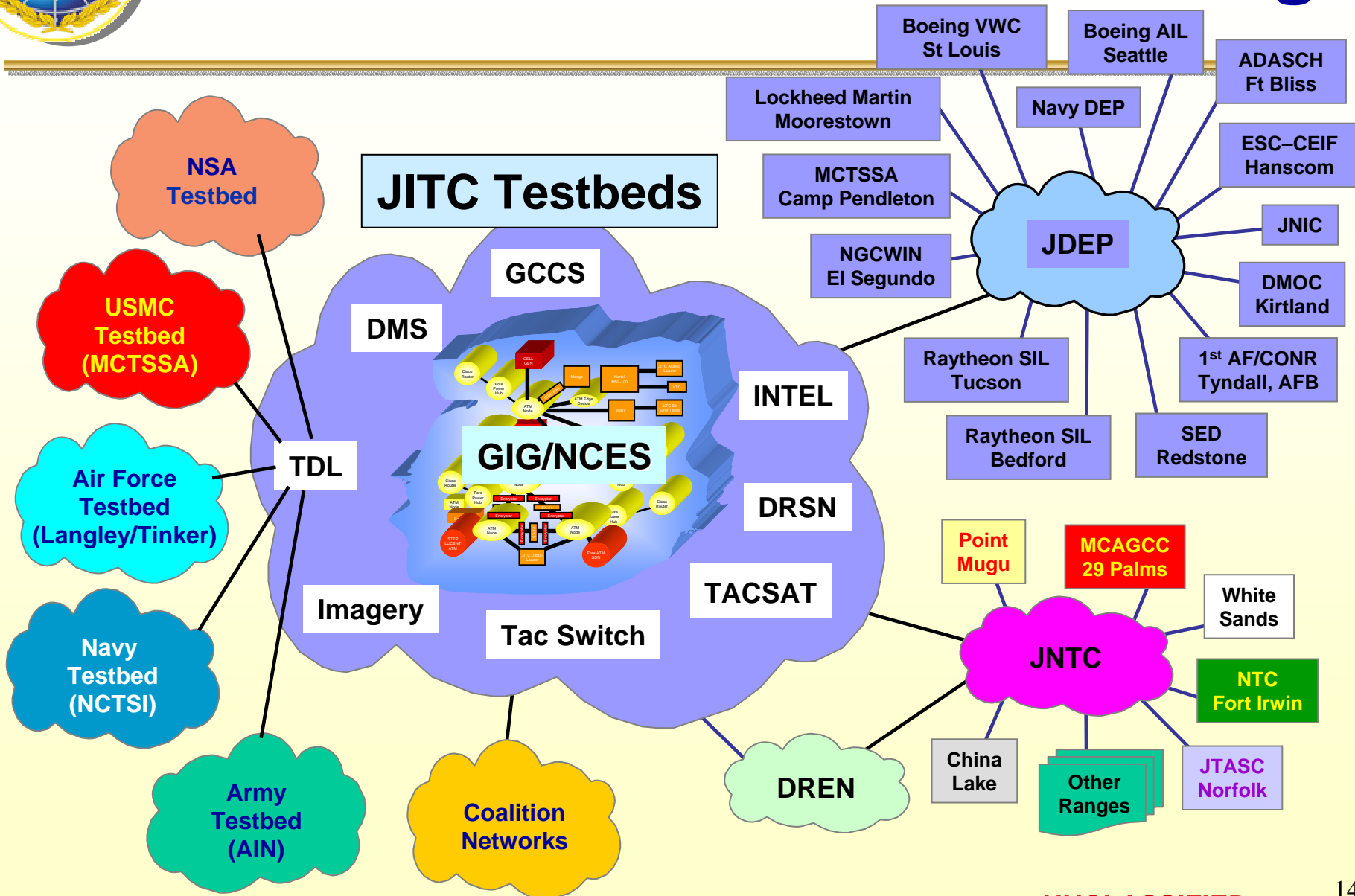
- **NCOW Reference Model**
- **Key Interface Profiles**
- **Information Assurance**
- **Integrated Architectures**



# JITC Testing Continuum



# Distributed Testing





# The Roadmap

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## Joint Battle Management Command and Control





# Pathfinder Programs

DISA GIG-BE								
DISA Net Centric Enterprise Services								
Application	Discovery	User Assistance	Collaboration	Storage	Mediation	Messaging	Enterprise Service Management	IA / Security
Joint	Army	Navy	USMC	USAF				
DJC2	DCGS-A	DCGS-N	DCGS-MC	DCGS-AF				
JC2	GCCS-A	GCCS-M					GCCS-AF	
JTIDS / MIDS	ABCS	CEC	C2PC	TBMCS				
JTRS	FCS	FORCEnet	TCO	MC2A				
WGS	WIN-T							
TSAT								
AEHF								



# Joint Pathfinder Programs

System	CERTIFIED RQMNTS DOC's	CERTIFIED IKPP / IERS	CERTIFIED NR-KPP	INTEGRATED ARCH PRODUCTS	TEST CERTIFICATION STATUS
DJC2	ORD 11 Sep 03	Yes	No	Yes	FY 04
JC2	21 Jan 03	Yes	No	Limited	GCCS migrates to JC2 FY 06 to FY 08
JTIDS	17 Mar 94	No	No	No	
WGS	ORD 15 Mar 00	Yes	No	Yes	None
TSAT	CDD In staffing	Yes	No	Yes	None
AEHF	ORD 6 Sep 00	Yes	No	Yes	FY 05

DJC2	GCCS-J	TBMCS*	AFATDS*	DJC2 testing scheduled to begin June 04
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\* Tested for VMF message capability only



# Joint Pathfinder Programs: JTRS

JTRS		CERTIFIED RQMNTS DOC's	CERTIFIED IKPP / IERS	CERTIFIED NR-KPP	INTEGRATED ARCH PRODUCTS	TEST CERTIFICATION STATUS
Cluster	1	ORD v3.2* 9 Apr03  JROCM 087-03	Yes	No	Yes	2Q05
	2 / MIBTR					EOA Apr 04 OT Oct 04
	3 / 4					
	5					

\* All clusters based on the same ORD



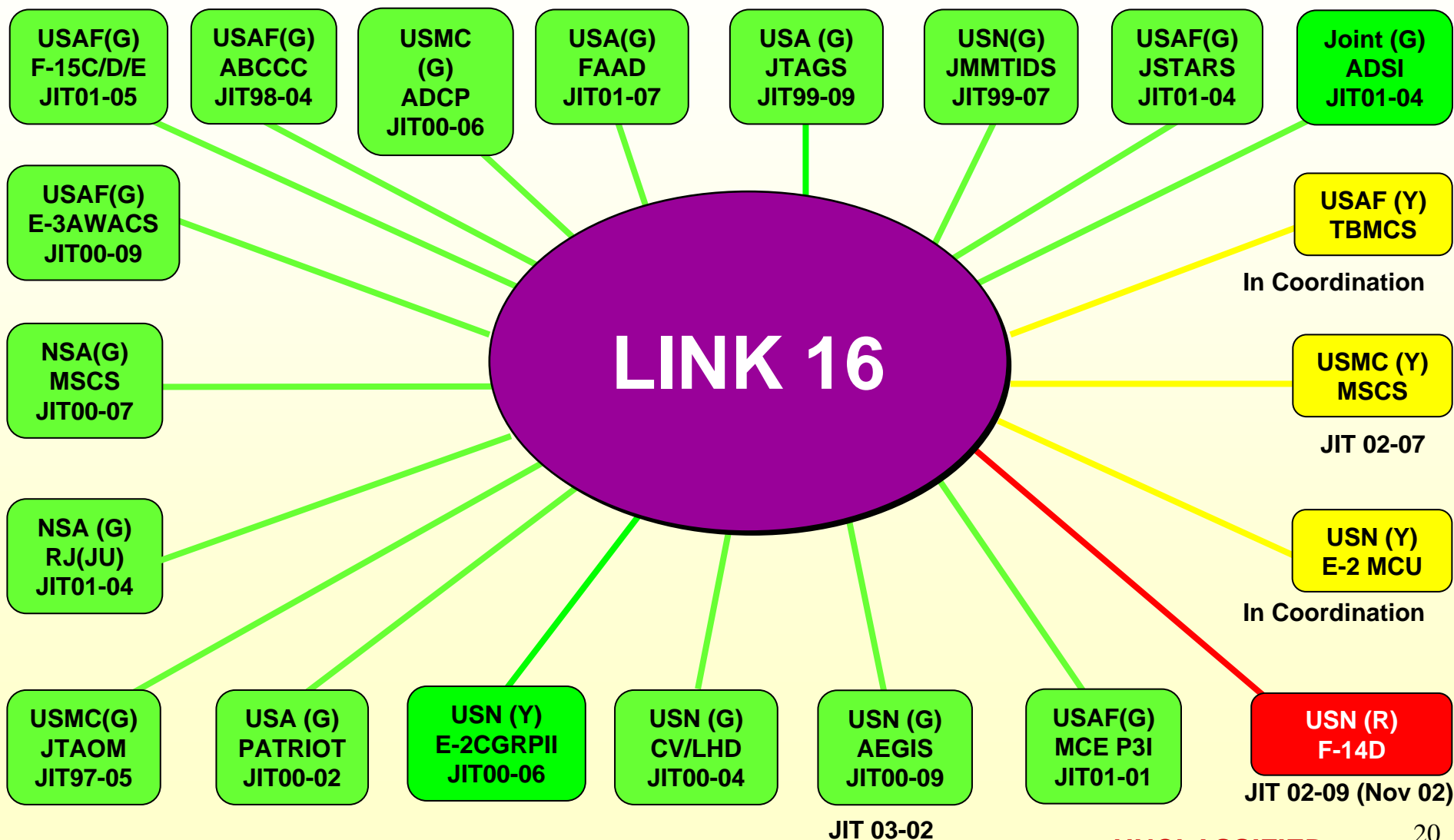
# Joint Pathfinder Programs: MIDS

System		CERTIFIED RQMNTS DOC's	CERTIFIED IKPP / IERS	CERTIFIED NR-KPP	INTEGRATED ARCH PRODUCTS	TEST CERTIFICATION STATUS
MIDS	LVT-1			No		
	LVT-2	ORD 15 July 03	Yes	No	Yes	Sep 03
	LVT-3			No		



# LINK 16 Systems

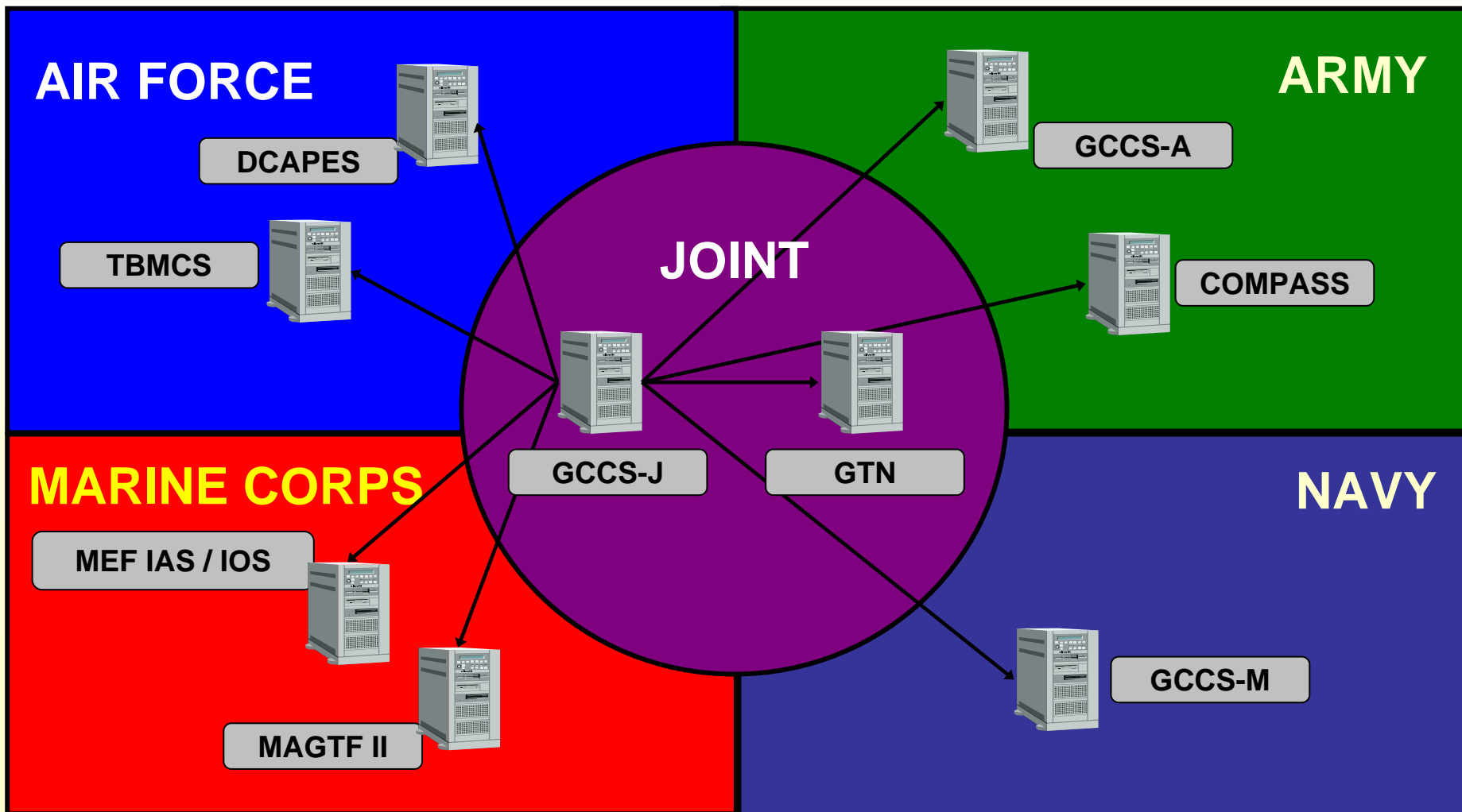
## Interface Certification Status





# Pathfinder Programs

## Service GCCS Variants



# Pathfinder Programs

## Service GCCS Variants



SYSTEM		CERTIFIED RQMNTS DOC's	CERTIFIED IKPP / IERS	CERTIFIED NR-KPP	INTEGRATED ARCH PRODUCTS	TEST CERTIFICATION STATUS
JOINT	GCCS-J 3.x	No	No	No	No	Spec Interface
	GCCS-J 4.x	No	No	No	No	OT January 2004
	GTN-21	ORD 9 FEB 2001	Yes	No	No	IOC OT August 04
USA	GCCS-A B3	No	No	No	No	Spec Interface
	GCCS-A B4	ORD 16 NOV 2000	Yes	No	No	GCCS-J OT a
	COMPASS	No	No	No	No	GCCS-J OT a
USN	GCCS-M 3.x	ORD 12 FEB 1999	No	No	No	Spec Interface
	GCCS-M 4.x	ORD 12 FEB 1999	No	No	No	Coord with PM
USAF	DCAPES 3.1.5	ORD 28 MAR 1996	No	No	No	Spec Interface
	TBMCS 1.1.2	ORD 9 JUL 2001	Yes	No	No	Spec Interfaces
USMC	IOS V1	No	No	No	No	None
	MEF IAS	DRAFT ORD	No	NO	NO	OT 3 / 4 QTR 04
	MAGTF II 6.3	No	No	No	No	Spec Interface



# Pathfinder Programs

## Service DCGS Variants



System		CERTIFIED RQMNTS DOC's	CERTIFIED IKPP / IERS	CERTIFIED NR-KPP	INTEGRATED ARCH PRODUCTS	TEST CERTIFICATION STATUS
USA	DCGS-A	ORD In Staffing	Not Req'd	In Staffing	In Staffing	Testing component programs
USN	DCGS-N	No	No	No	No	None
USAF	DCGS-AF	Oct 2001	Yes	No	Yes	Feb 04
USMC	DCGS-MC	Pursuing individual program documents	I-KPP Packages In Staffing	No	Yes	CJTFX Jun 04

System	Service DCGS Interfaces / Sub-Systems						
DCGS-A	ASAS	CHIMS	GRIFN	IPF	HSOC	TES	
DCGS-N	SSEE-D/E	BGPHEs	CDF	JSIPS-N	UAV-TCS	TES-N	GCCS-M*
DCGS-MC	TEG	IAS	TCAC	CGS**	Navy has not determined if TCS will be a POR		
DCGS-AF	Testing scheduled to begin in Feb 04						

\* Specified Interfaces

\*\* USMC joined with Army CGS program



# Army Pathfinder Programs

System	CERTIFIED RQMNTS DOC's	CERTIFIED IKPP / IERS	CERTIFIED NR-KPP	INTEGRATED ARCH PRODUCTS	TEST CERTIFICATION STATUS
ABCS	CRD 11 Jun 01	No	No	No	None
FCS	ORD 27 Mar 03	Yes	No	Yes	None
WIN-T	ORD 10 Feb 03	Yes	No	Yes	None

System	Sub-Systems / Interfaces Certification Status							
ABCS	SINGARS	EPLRS	INC	FBCB2	MCS	ASAS	AFATDS	AMDWS

\*MCS / TCO interoperability limited to exchanging 8 JVMF messages



# Army Pathfinder Programs: FCS

## FCS Core IO Status

Maneuver	Intel	Fire Support	ADA	MOB/ Surv	Logistics	C2
LW Block II	<b>DCGS-A</b>	<b>LLDR MK VII</b>			<b>GCSS-A</b>	<b>JTRS</b>
<b>Comanche</b>	<b>JBPDS</b>	<b>Q-36</b>			<b>AAFARS</b>	<b>WIN-T</b>
Combat ID	(assessment)	<b>Firefinder</b>			<b>HEMTT</b>	<b>SECOMP I</b>
CKEM	<b>JCAD</b>	<b>Excalibur</b>	<b>Q-64 Sentinel</b>	<b>HSTAMIDS</b>	<b>- Wrecker</b>	<b>Comanche</b>
BLOS	JLSCAD	<b>MOFA</b>			<b>- Tanker</b>	<b>WNW</b>
- <b>Javelin P3I</b>	<b>Radiac Set</b>	<b>Non-Lethal</b>			<b>- LHS</b>	<b>LW Block II</b>
- <b>MRM</b>		<b>155mm</b>			<b>HMMWV</b>	<b>Mvmt Track System (Log)</b>
					<b>FMTV</b>	
					<b>LHS Fuel Farm</b>	
					<b>MC 4</b>	
					<b>PLS Trailer</b>	
					<b>Maint. Truck</b>	
					<b>LWP</b>	
					<b>HIPPO</b>	
					<b>CAMEL</b>	



# Navy Pathfinder Programs

System		CERTIFIED RQMNTS DOC's	CERTIFIED IKPP / IERS	CERTIFIED NR-KPP	INTEGRATED ARCH PRODUCTS	TEST CERTIFICATION STATUS		
FORCEnet								
FORCEnet Combat Systems Interfaces								
AWACS	Patriot	AEGIS	CVN	E-2C	Allies	CEC	JSIPS-N	GCCS-M
FORCEnet Communication Systems Interfaces								
IAS (Family)	GBS	DDS	TDL	EPLRS	CDL (Family)	AWS	WB MILSAT	WB COMSAT
MUOS	NB MILSAT	EHF	A/EHF- MRD	JTRS (CNR)				

System		CERTIFIED RQMNTS DOC's	CERTIFIED IKPP / IERS	CERTIFIED NR-KPP	INTEGRATED ARCH PRODUCTS	TEST CERTIFICATION STATUS		
CEC		ORD 6 Nov 01	Yes	No	Yes	None		



# USMC Pathfinder Programs

System	CERTIFIED RQMNTS DOC's	CERTIFIED IKPP / IERS	CERTIFIED NR-KPP	INTEGRATED ARCH PRODUCTS	TEST CERTIFICATION STATUS
C2PC					
TCO					*Specified Interfaces

\*MCS / TCO interoperability limited to exchanging 8 JVMF messages

System	Sub-Systems / Interfaces							
C2PC	TBDM	*TCO	IAS	GCCS				
TCO	DMS	C2PC	IAS	GCCS				



# USAF Pathfinder Programs

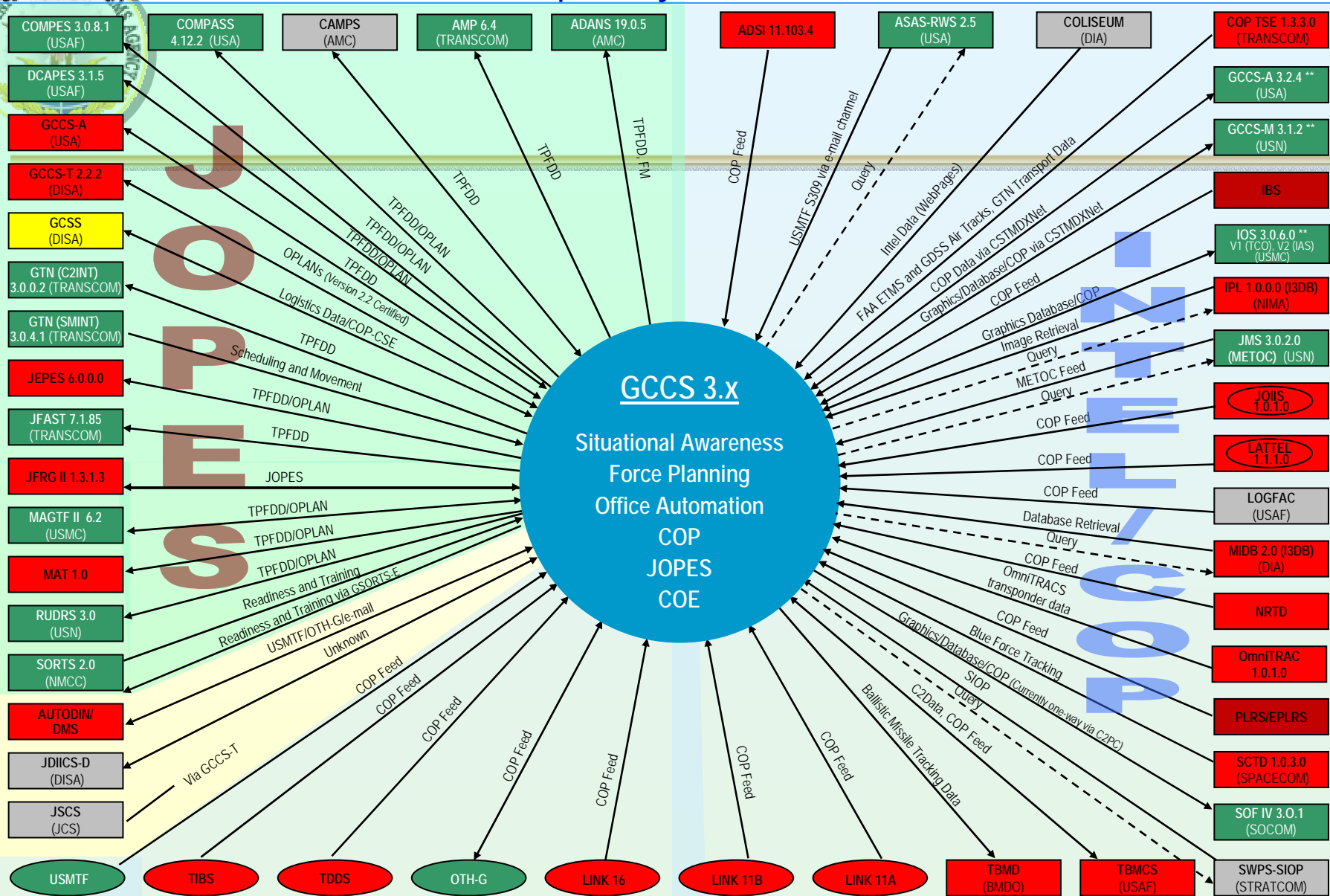
System	CERTIFIED RQMNTS DOC's	CERTIFIED IKPP / IERS	CERTIFIED NR-KPP	INTEGRATED ARCH PRODUCTS	TEST CERTIFICATION STATUS
TBMCS	ORD 9 July 01	Yes	No	Yes	Specified Interfaces
MC2A (MC-10A) Replaces AWACS, Joint- STARS and Rivet Joint	CDD in- staffing				Oct 02 - Sep 04



# DISA Pathfinder Programs

System	CERTIFIED RQMNTS DOC's	CERTIFIED IKPP / IERS	CERTIFIED NR-KPP	INTEGRATED ARCH PRODUCTS	TEST CERTIFICATION STATUS
GIG-BE	No	No	No	No	Six site OA June - July 04  Testing of GIG IOC configuration Aug – Sep 04
NCES	No	No	No	No	No



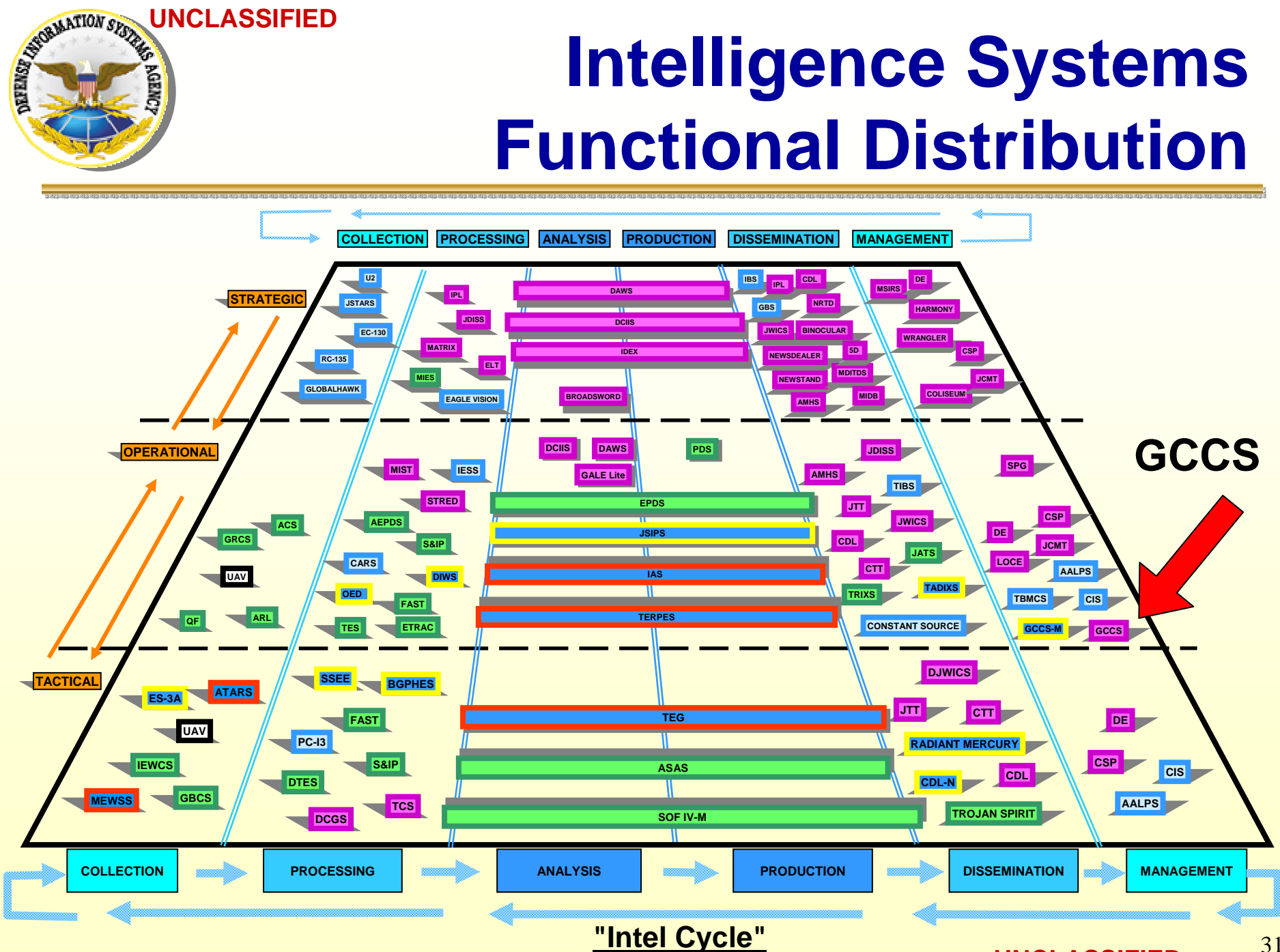


\* Interfaces based on GCCS Requirements Implementation Document (RID) and EPIP, 22 Dec 98; Master Interface Document (ICD), 31 May 01; and other requirement sources. For the latest copy, go to: <http://jitc.fhu.disa.mil/gccsiop/>

\*\* Full capability not assessed. Certification is limited to the items addressed in the certification letter.

**U N C L A S S I F I E D**

# Intelligence Systems Functional Distribution





# JITC's JBMC2 Related Test Capabilities

## SIGP

### Army JBMC2

- ABCS
- FCS

### USMC JBMC2

- C2PC
- TCO



## Flagship

FCS  
MC2A  
GIG-BE  
NCES  
FORCEnet  
ACS

## Battlespace Awareness

DCGS-A  
DCGS-N  
DCGS-MC  
DCGS-AF

MC2A  
ACS

## Operational C2

DJC2  
JC2  
GCCS  
NCES  
FCSMC2A  
GIG

## SIAP

MC2A  
FORCEnet  
FAADC2  
Army Software  
Upgrades

## GIG-BE / IPv6

DJC2  
JC2  
GCCS  
FCS  
MC2A  
GIG  
NCES



# JITC Areas of Expertise

- Asynchronous Transfer Mode (ATM)
- Combined Interoperability
- Command and Control (C2)
- Defense Information System Network (DISN)
- Defense Message System (DMS)
- Defense Red Switch Network (DRSN)
- Department of Defense Intelligence Information System (DODIIS)
- DFAS Corporate Information Infrastructure (DCII)
- Electronic Business / Electronic Commerce (EB / EC)
- Global Command and Control System (GCCS)
- Global Combat Support System (GCSS)
- High Frequency Test Facility (HFTF0)
- Information Assurance (IA)
- Joint Tactical Radio System (JTRS)
- Joint Theater Air & Missile Defense (JTAMD)
- Key Management Infrastructure (PKI, PKE, GDS and EKMS)
- National Imagery Transmission Format Standard (NITFS)
- Missile Defense (MD)
- Optical Switching
- Satellite Communications
- Tactical Communications
- Tactical Digital Information Link (TADIL)
- Telemedicine
- US Message Text Format (USMTF)
- Unmanned Aerial Vehicle (UAV)



# JBMC2 Lab



## Mission:

- Identifying and solving Command, Control, Communications, Computers and Intelligence (C4I) and Combat Support Systems interoperability deficiencies
- Providing C4I joint and combined interoperability testing, evaluation and certification
- Providing training on C4I systems, as appropriate



# JBMC2 Lab

- **Capabilities:**

- Developmental Testing
- Modified Developmental Testing (Installation, Functionality, User Acceptance)
- Compatibility Testing (with previous versions, in a heterogeneous environment)
- Interoperability Testing (military message formats, other COP systems)
- Performance Testing (timings, latency, bottlenecks, troubleshooting)
- Operational Test and Evaluation





# JBMC2 Lab

- **Major Test Equipment**
  - **Common Operation Picture (COP) Suite**
    - Multiple Track Database Managers (TDBM)
    - COP Clients
    - Command and Control PC (C2PC)
  - **Simulators**
    - Repeatable Performance Evaluation and Analysis Tool (REPEAT)
    - Tactical Receive Equipment (TRE) Simulator (TRESIM)
    - Multi-Arena Remote Simulator (MARS)
  - **Joint Global Command and Control System (GCCS) Suite (Joint Operation and Execution System (JOPES) and COP)**





# JBMC2 Lab

- **Additional information**
  - **JITC is the preeminent information systems evaluator, reducing risk to the warfighter by providing value-added process and product evaluations, operational assessments, and technical assistance throughout the life cycle of DoD Systems**
  - **We work closely with the Service PMs for JBMC2 systems to address interoperability issues**

# JTRS Lab



## Mission:

To determine the degree to which JTRS sets conform to the requirements of the MIL-STDs associated with the 31 JTRS waveforms, and to determine the degree to which JTRS sets are interoperable with legacy radios and other JTRS radio sets.



# JTRS Lab

- **Capabilities:**

- Test radio compliance to numerous MIL-STDs
- Test VHF and UHF radio interoperability
- Troubleshoot hotline requests from warfighter for VHF and UHF radio equipment
- Participate as end-user (if needed) for operational tests and exercises
- Develop MIL-STD test procedures
- Provide technical advice to DOD at large



# JTRS Lab

- **Major Test Equipment**
  - 6 Signal Generators
  - 6 Spectrum Analyzers
  - 4 Oscilloscopes
  - 2 Vector Analyzers
  - 1 Protocol Analyzer
  - 5 Frequency Counters
  - 6 Bit Error Ratio Testers
  - 1 GPS Time/Frequency Reference
  - 4 Power Meters